

Figure 1

AD7c-NTP

Nucleic Acid and Amino Acid Sequence

(Sequences 120 and 121 from U.S. Patent Nos. 5,830,670, 5,948,634, and 5,948,888; de la Monte *et al.*, *J. Clin. Invest.*, 100: 3093-3104 (1997))

NCBI Entrez-Protein Accession # AAC08737; PID g3002527

```
1 ttttttttttttgag  ATG GAG TTT TCG CTC TTG TTG CCC AGG CTG GAG TGC AAT GGC GCA ATC 62
   M  E  F  S  L  L  L  P  R  L  E  C  N  G  A  I  16
   Met-Glu-Phe-Ser-Leu=Leu-Leu-Pro-Arg-Leu-Glu-Cys-Asn-Gly-Ala-Ile-
63 TCA GCT CAC CGC AAC CTC CGC CTC CCG GGT TCA AGC GAT TCT CCT GCC TCA GCC TCC CCA 122
17 S  A  H  R  N  L  R  L  P  G  S  S  D  S  P  A  S  A  S  P  36
   Ser-Ala-His-Arg-Asn-Leu-Arg-Leu-Pro-Gly-Ser-Ser-Asp-Ser-Pro-Ala-Ser-Ala-Ser-Pro-
123 GTA GCT GGG ATT ACA GGC ATG TGC ACC CAC GCT CGG CTA ATT TTG TAT TTT TTT TTA GTA 182
37 V  A  G  I  T  G  M  C  T  H  A  R  L  I  L  Y  F  F  L  V  56
   Val-Ala-Gly-Ile-Thr-Gly-Met-Cys-Thr-His-Ala-Arg-Leu-Ile-Leu-Tyr-Phe-Phe-Leu-Val-
183 GAG ATG GAG TTT CTC CAT GTT GGT CAG GCT GGT CTC GAA CTC CCG ACC TCA GAT GAT CCC 242
57 E  M  E  F  L  H  V  G  Q  A  G  L  E  L  P  T  S  D  D  P  76
   Glu-Met-Glu-Phe-Leu-His-Val-Gly-Gln-Ala-Gly-Leu-Glu-Leu-Pro-Thr-Ser-Asp-Asp-Pro-
243 TCC GTC TCG GCC TCC CAA AGT GCT AGA TAC AGG ACT GGC CAC CAT GCC CGG CTC TGC CTG 302
77 S  V  S  A  S  Q  S  A  R  Y  R  T  G  H  H  A  R  L  C  L  96
   Ser-Val-Ser-Ala-Ser-Gln-Ser-Ala-Arg-Tyr-Arg-Thr-Gly-His-His-Ala-Arg-Leu-Cys-Leu-
303 GCT AAT TTT TGT GGT AGA AAC AGG GTT TCA CTG ATG TGC CCA AGC TGG TCT CCT GAG CTC 362
97 A  N  F  C  G  R  N  R  V  S  L  M  C  P  S  W  S  P  E  L  116
   Ala-Asn-Phe-Cys-Gly-Arg-Asn-Arg-Val-Ser-Leu-Met-Cys-Pro-Ser-Trp-Ser-Pro-Glu-Leu-
363 AAG CAG TCC ACC TGC CTC AGC CTC CCA AAG TGC TGG GAT TAC AGG CGT GCA GCC GTG CCT 422
117 K  Q  S  T  C  L  S  L  P  K  C  W  D  Y  R  R  A  A  V  P  136
   Lys-Gln-Ser-Thr-Cys-Leu-Ser-Leu-Pro-Lys-Cys-Trp-Asp-Tyr-Arg-Arg-Ala-Ala-Val-Pro-
423 GGC CTT TTT ATT TTA TTT TTT TTA AGA CAC AGG TGT CCC ACT CTT ACC CAG GAT GAA GTG 482
137 G  L  F  I  L  F  F  L  R  H  R  C  P  T  L  T  Q  D  E  V  156
   Gly-Leu-Phe-Ile-Leu-Phe-Phe-Leu-Arg-His-Arg-Cys-Pro-Thr-Leu-Thr-Gln-Asp-Glu-Val-
483 CAG TGG TGT GAT CAC AGC TCA CTG CAG CCT TCA ACT CCT GAG ATC AAG CAT CCT CCT GCC 542
157 Q  W  C  D  H  S  S  L  Q  P  S  T  P  E  I  K  H  P  P  A  176
   Gln-Trp-Cys-Asp-His-Ser-Ser-Leu-Gln-Pro-Ser-Thr-Pro-Glu-Ile-Lys-His-Pro-Pro-Ala-
543 TCA GCC TCC CAA GTA GCT GGG ACC AAA GAC ATG CAC CAC TAC ACC TGG CTA ATT TTT ATT 602
177 S  A  S  Q  V  A  G  T  K  D  M  H  H  Y  T  W  L  I  F  I  196
   Ser-Ala-Ser-Gln-Val-Ala-Gly-Thr-Lys-Asp-Met-His-His-Tyr-Thr-Trp-Leu-Ile-Phe-Ile-
603 TTT ATT TTT AAT TTT TTG AGA CAG AGT CTC AAC TCT GTC ACC CAG GCT GGA GTG CAG TGG 662
197 F  I  F  N  F  L  R  Q  S  L  N  S  V  T  Q  A  G  V  Q  W  216
   Phe-Ile-Phe-Asn-Phe-Leu-Arg-Gln-Ser-Leu-Asn-Ser-Val-Thr-Gln-Ala-Gly-Val-Gln-Trp-
663 CGC AAT CTT GGC TCA CTG CAA CCT CTG CCT CCC GGG TTC AAG TTA TTC TCC TGC CCC AGC 722
217 R  N  L  G  S  L  Q  P  L  P  P  G  F  K  L  F  S  C  P  S  236
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Arg-Asn-Leu-Gly-Ser-Leu-Gln-Pro-Leu-Pro-Pro-Gly-Phe-Lys-Leu-Phe-Ser-Cys-Pro-Ser-

723 CTC CTG AGT AGC TGG GAC TAC AGG CGC CCA CCA CGC CTA GCT AAT TTT TTT GTA TTT TTA 782
237 L L S S W D Y R R P P R L A N F F V F L 256
Leu-Leu-Ser-Ser-Trp-Asp-Tyr-Arg-Arg-Pro-Pro-Arg-Leu-Ala-Asn-Phe-Phe-Val-Phe-Leu-

783 GTA GAG ATG GGG TTC ACC ATG TTC GCC AGG TTG ATC TTG ATC TCT GGA CCT TGT GAT CTG 842
257 V E M G F T M F A R L I L I S G P C D L 276
Val-Glu-Met-Gly-Phe-Thr-Met-Phe-Ala-Arg-Leu-Ile-Leu-Ile-Ser-Gly-Pro-Cys-Asp-Leu-

843 CCT GCC TCG GCC TCC CAA AGT GCT GGG ATT ACA GGC GTG AGC CAC CAC GCC CGG CTT ATT 902
277 P A S A S Q S A G I T G V S H H A R L I 296
Pro-Ala-Ser-Ala-Ser-Gln-Ser-Ala-Gly-Ile-Thr-Gly-Val-Ser-His-His-Ala-Arg-Leu-Ile-

903 TTT AAT TTT TGT TTG TTT GAA ATG GAA TCT CAC TCT GTT ACC CAG GCT GGA GTG CAA TGG 962
297 F N F C L F E M E S H S V T Q A G V Q W 316
Phe-Asn-Phe-Cys-Leu-Phe-Glu-Met-Glu-Ser-His-Ser-Val-Thr-Gln-Ala-Gly-Val-Gln-Trp-

963 CCA AAT CTC GGC TCA CTG CAA CCT CTG CCT CCC GGG CTC AAG CGA TTC TCC TGT CTC AGC 1022
317 P N L G S L Q P L P P G L K R F S C L S 336
Pro-Asn-Leu-Gly-Ser-Leu-Gln-Pro-Leu-Pro-Pro-Gly-Leu-Lys-Arg-Phe-Ser-Cys-Leu-Ser-

1023 CTC CCA AGC AGC TGG GAT TAC GGG CAC CTG CCA CCA CAC CCC GCT AAT TTT TGT ATT TTC 1082
337 L P S S W D Y G H L P P H P A N F C I F 356
Leu-Pro-Ser-Ser-Trp-Asp-Tyr-Gly-His-Leu-Pro-Pro-His-Pro-Ala-Asn-Phe-Cys-Ile-Phe-

1083 ATT AGA GGC GGG GTT TCA CCA TAT TTG TCA GGC TGG TCT CAA ACT CCT GAC CTC AGG tgac
1143

357 I R G G V S P Y L S G W S Q T P D L R
375
Ile-Arg-Gly-Gly-Val-Ser-Pro-Tyr-Leu-Ser-Gly-Trp-Ser-Gln-Thr-Pro-Asp-Leu-Arg

1144 ccacctgcctcagccttccaaagtgcctgggattacaggcgtgagccacctcacccagccggctaatttagataaaaaaat
1223

1224 atgtagcaatggggggtcttgctatgttgcccaggctgggtctcaaacttctggcttcatgcaatccttccaaatgagcca
1303

1304 caacacccagccagtcacatTTTTTaaacagttacatctttatTTTtagtataactagaaagtaatacaataaacatgtcaa
1383

1384 acctgcaaattcagtagtaacagagttctTTTTataactTTTTaaacaaagctTTtagagca 1442

Figure 2

NTP, 122 amino acids

(Sequence 40 from U.S. Patent Nos. 5,830,670, 5,948,634, and 5,948,888)

NCBI Entrez-Protein Accession #AAE25447 PID g10048540

Amino Acid Sequence

1 Met-Met-Val-Cys-Trp-Asn-Arg-Phe-Gly-Lys-
M M V C W N R F G K

11 Trp-Val-Tyr-Phe-Ile-Ser-Ala-Ile-Phe-Asn-
W V Y F I S A I F N

21 Phe-Gly-Pro-Arg-Tyr-Leu-Tyr-His-Gly-Val-
F G P R Y L Y H G V

31 Pro-Phe-Tyr-Phe-Leu-Ile-Leu-Val-Arg-Ile-
P F Y F L I L V R I

41 Ile-Ser-Phe-Leu-Ile-Gly-Asp-Met-Glu-Asp-
I S F L I G D M E D

51 Val-Leu-Leu-Asn-Cys-Thr-Leu-Leu-Lys-Arg-
V L L N C T L L K R

61 Ser-Ser-Arg-Phe-Arg-Phe-Trp-Gly-Ala-Leu-
S S R F R F W G A L

71 Val-Cys-Ser-Met-Asp-Ser-Cys-Arg-Phe-Ser
V C S M D S C R F S

81 Arg-Val-Ala-Val-Thr-Tyr-Arg-Phe-Ile-Thr-
R V A V T Y R F I T

91 Leu-Leu-Asn-Ile-Pro-Ser-Pro-Ala-Val-Trp-
L L N I P S P A V W

101 Met-Ala-Arg-Asn-Thr-Ile-Asp-Gln-Gln-Val-
M A R N T I D Q Q V

111 Leu-Ser-Arg-Ile-Lys-Leu-Glu-Ile-Lys-Arg-
L S R I K L E I K R

121 Cys-Leu
C L

Figure 3

NTP, 112 amino acids

NCBI Entrez-Protein Accession #XP_032307 PID g14725132

Amino Acid Sequence

1 Met-Ala-Gln-Ser-Arg-Leu-Thr-Ala-The-Ser-
M A Q S R L T A T S
11 Ala-Ser-Arg-Val-Gln-Ala-Ile-Leu-Leu-Ser-
A S R V Q A I L L S
21 Gln-Pro-Pro-Lys-Gln-Leu-Gly-Leu-Arg-Ala-
Q P P K Q L G L R A
31 Pro-Ala-Asn-Thr-Pro-Leu-Ile-Phe-Val-Phe-
P A N T P L I F V F
41 Ser-Leu-Glu-Ala-Gly-Phe-His-His-Ile-Cys-
S L E A G F H H I C
51 Gln-Ala-Gly-Leu-Lys-Leu-Leu-Thr-Ser-Gly-
Q A G L K L L T S G
61 Asp-Pro-Pro-Ala-Ser-Ala-Phe-Gln-Ser-Ala-
D P P A S A F Q S A
71 Gly-Ile-Thr-Gly-Val-Ser-His-Leu-Thr-Gln-
G I T G V S H L T Q
81 Pro-Ala-Asn-Leu-Asp-Lys-Lys-Ile-Cys-Ser-
P A N L D K K I C S
91 Asn-Gly-Gly-Ser-Cys-Tyr-Val-Ala-Gln-Ala-
N G G S C Y V A Q A
101 Gly-Leu-Lys-Leu-Leu-Ala-Ser-Cys-Asn-Pro-
G L K L L A S C N P
111 Ser-Lys
S K

Figure 4

NTP, 106 amino acids

NCBI Entrez-Protein Accession #AAH14951 PID g15928971

1 Met-Trp-Thr-Leu-Lys-Ser-Ser-Leu-Val-Leu-
M W T L K S S L V L

11 Leu-Leu-Cys-Leu-Thr-Cys-Ser-Tyr-Ala-Phe-
L L C L T C S Y A F

21 Met-Phe-Ser-Ser-Leu-Arg-Gln-Lys-Thr-Ser-
M F S S L R Q K T S

31 Glu-Pro-Gln-Gly-Lys-Val-Pro-Cys-Gly-Glu-
E P Q G K V P C G E

41 His-Phe-Arg-Ile-Arg-Gln-Asn-Leu-Pro-Glu-
H F R I R Q N L P E

51 His-Thr-Gln-Gly-Trp-Leu-Gly-Ser-Lys-Trp-
H T Q G W L G S K W

61 Leu-Trp-Leu-Leu-Phe-Ala-Val-Val-Pro-Phe-
L W L L F A V V P F

71 Val-Ile-Leu-Lys-Cys-Gln-Arg-Asp-Ser-Glu-
V I L K C Q R D S E

81 Lys-Asn-Lys-Val-Arg-Met-Ala-Pro-Phe-Phe-
K N K V R M A P F F

91 Leu-His-His-Ile-Asp-Ser-Ile-Ser-Gly-Val-
L H H I D S I S G V

101 Ser-Gly-Lys-Arg-Met-Phe
S G K R M F

Figure 5

NTP, 106 amino acids

NCBI Entrez-Protein Accession #XP_039102, PID g18599339

1 Met-Phe-Phe-Val-Leu-Tyr-Arg-Phe-Cys-Phe-
M F F V L Y R F C F

11 Cys-Phe-Phe-Glu-Thr-Glu-Ser-His-Ser-Leu-
C F F E T E S H S L

21 Thr-Gln-Ala-Gly-Val-Gln-Trp-Cys-Glu-Leu-
T Q A G V Q W C E L

31 Gly-Ser-Pro-Gln-Pro-Leu-Pro-Ser-Gly-Phe-
G S P Q P L P S G F

41 Lys-Arg-Phe-Ser-Cys-Leu-Ser-Leu-Leu-Ser-
K R F S C L S L L S

51 Ser-Trp-Asp-Tyr-Ser-His-Glu-Pro-Pro-His-
S W D Y S H E P P H

61 Pro-Val-Ile-Cys-Ser-Phe-Leu-Met-Glu-Lys-
P V I C S F L M E K

71 Cys-Leu-Ile-Leu-Tyr-Lys-Pro-Asn-Gly-Asp-
C L I L Y K P N G D

81 Thr-Ile-Gly-Pro-Ile-Leu-Val-Gln-Gln-Gly-
T I G P I L V Q Q G

91 Lys-Arg-Gln-Lys-Leu-Tyr-Ile-Ser-Ala-Asp-
K R Q K L Y I S A D

100 Leu-Val-His-Leu-Ile-Ala
L V H L I A

Figure 6

NTP, 98 amino acids

(Sequence 30 from U.S. Patent Nos. 5,830,670, 5,948,634, and 5,948,888)

NCBI Entrez-Protein Accession # AAE25445, PID g10048538

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1   Glu-Ala-Tyr-Tyr-Thr-Met-Leu-His-Leu-Pro-
    E  A  Y  Y  T  M  L  H  L  P

11  Thr-Thr-Asn-Arg-Pro-Lys-Ile-Ala-His-Cys
    T  T  N  R  P  K  I  A  H  C

21  Ile-Leu-Phe-Asn-Gln-Pro-His-Ser-Pro-Arg-
    I  L  F  N  Q  P  H  S  P  R

31  Ser-Asn-Ser-His-Ser-His-Pro-Asn-Pro-Leu-
    S  N  S  H  S  H  P  N  P  L

41  Lys-Leu-His-Arg-Arg-Ser-His-Ser-His-Asn-
    K  L  H  R  R  S  H  S  H  N

51  Arg-Pro-Arg-Ala-Tyr-Ile-Leu-Ile-Thr-Ile-
    R  P  R  A  Y  I  L  I  T  I

61  Leu-Pro-Ser-Lys-Leu-Lys-Leu-Arg-Thr-His-
    L  P  S  K  L  K  L  R  T  H

71  Ser-Gln-Ser-His-His-Asn-Pro-Leu-Ser-Arg-
    S  Q  S  H  H  N  P  L  S  R

81  Thr-Ser-Asn-Ser-Thr-Pro-Thr-Asn-Ser-Phe-
    T  S  N  S  T  P  T  N  S  F

91  Leu-Met-Thr-Ser-Ser-Lys-Pro-Arg
    L  M  T  S  S  K  P  R
```

Figure 7

NTP, 75 amino acids

(Sequence 48 from U.S. Patent Nos. 5,830,670, 5,948,634, and 5,948,888)

NCBI Entrez-Protein Accession #AAE25448, PID g10048541

1 Ser-Ser-Ser-Leu-Gly-Leu-Pro-Lys-Cys-Trp-
S S S L G L P K C W

11 Asp-Tyr-Arg-His-Glu-Leu-Leu-Ser-Leu-Ala-
D Y R H E L L S L A

21 Leu-Met-Ile-Asn-Phe-Arg-Val-Met-Ala-Cys
L M I N F R V M A C

31 Thr-Phe-Lys-Gln-His-Ile-Glu-Leu-Arg-Gln-
T F K Q H I E L R Q

41 Lys-Ile-Ser-Ile-Val-Pro-Arg-Lys-Leu-Cys-
K I S I V P R K L C

51 Cys-Met-Gly-Pro-Val-Cys-Pro-Val-Lys-Ile-
C M G P V C P V K I

61 Ala-Leu-Leu-Thr-Ile-Asn-Gly-His-Cys-Thr-
A L L T I N G H C T

71 Trp-Leu-Pro-Ala-Ser
W L P A S

Figure 8

NTP, 68 amino acids

(Sequence 36 from U.S. Patent Nos. 5,830,670, 5,948,634, and 5,948,888)

NCBI Entrez-Protein Accession #AAE25446, PID g10048539

1 Met-Phe-Val-Phe-Cys-Leu-Ile-Leu-Asn-Arg-
M F V F C L I L N R
11 Glu-Lys-Ile-Lys-Gly-Gly-Asn-Ser-Ser-Phe-
E K I K G G N S S F
21 Phe-Leu-Leu-Ser-Phe-Phe-Phe-Ser-Phe-Gln-
F L L S F F F S F Q
31 Asn-Cys-Cys-Gln-Cys-Phe-Gln-Cys-Arg-Thr-
N C C Q C F Q C R T
41 Thr-Glu-Gly-Tyr-Ala-Val-Glu-Cys-Phe-Tyr-
T E G Y A V E C F Y
51 Cys-Leu-Val-Asp-Lys-Ala-Ala-Phe-Glu-Cys-
C L V D K A A F E C
61 Trp-Trp-Phe-Tyr-Ser-Phe-Asp-Thr
W W F Y S F D T

Figure 9

NTP, 61 amino acids

NCBI Entrez-Protein Accession #AAH02534, PID g12803421

1 Met-Glu-Pro-His-Thr-Val-Ala-Gln-Ala-Gly-
M E P H T V A Q A G
11 Val-Pro-Gln-His-Asp-Leu-Gly-Ser-Leu-Gln-
V P Q H D L G S L Q
21 Ser-Leu-Leu-Pro-Arg-Phe-Lys-Arg-Phe-Ser-
S L L P R F K R F S
31 Cys-Leu-Ile-Leu-Pro-Lys-Ile-Trp-Asp-Tyr-
C L I L P K I W D Y
41 Arg-Asn-Met-Asn-Thr-Ala-Leu-Ile-Lys-Arg-
R N M N T A L I K R
51 Asn-Arg-Tyr-Thr-Pro-Glu-Thr-Gly-Arg-Lys-
N R Y T P E T G R K
61 Ser
S

Title: METHODS OF USING NEURAL THREAD
PROTEINS TO TREAT TUMORS AND OTHER
CONDITIONS REQUIRING THE REMOVAL OR
DESTRUCTION OF CELLS

Inventor(s): Paul Averbach
DOCKET NO.: 018792-0199

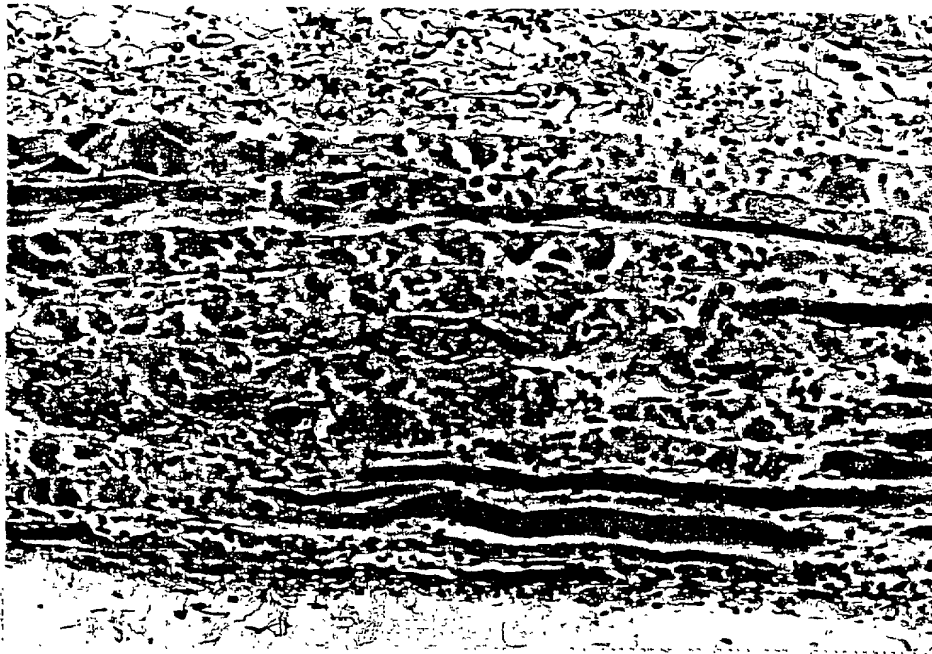


FIGURE 10

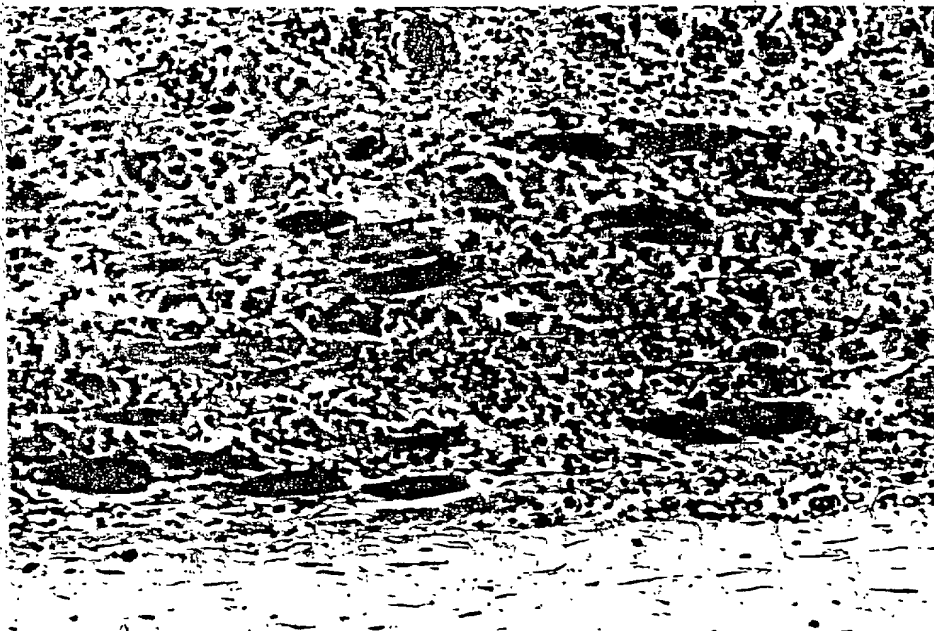


FIGURE 11

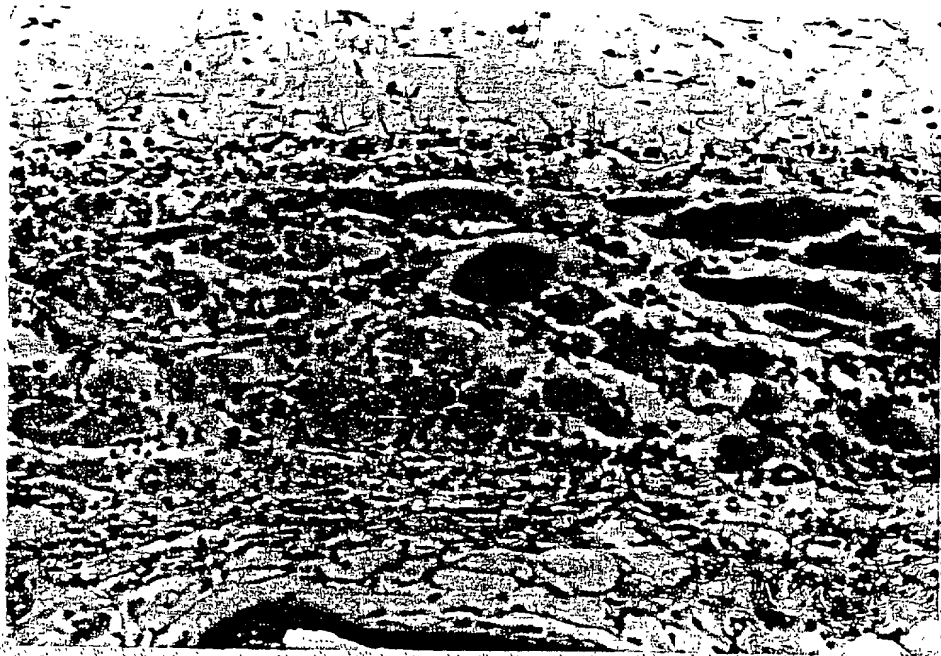


FIGURE 12

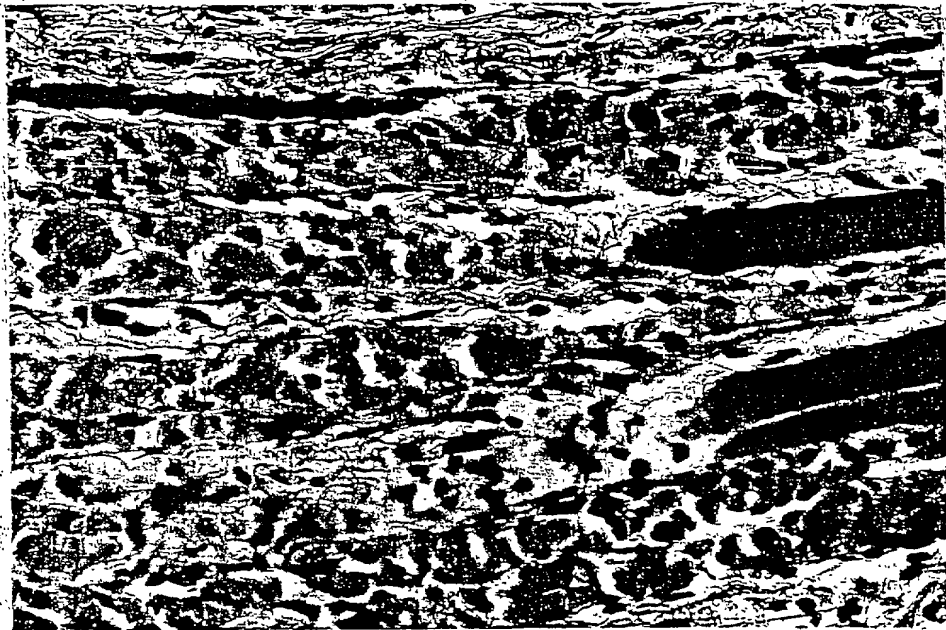


FIGURE 13

Title: METHODS OF USING NEURAL THREAD
PROTEINS TO TREAT TUMORS AND OTHER
CONDITIONS REQUIRING THE REMOVAL OR
DESTRUCTION OF CELLS

Inventor(s): Paul Averbach

DOCKET NO.: 018792-0199

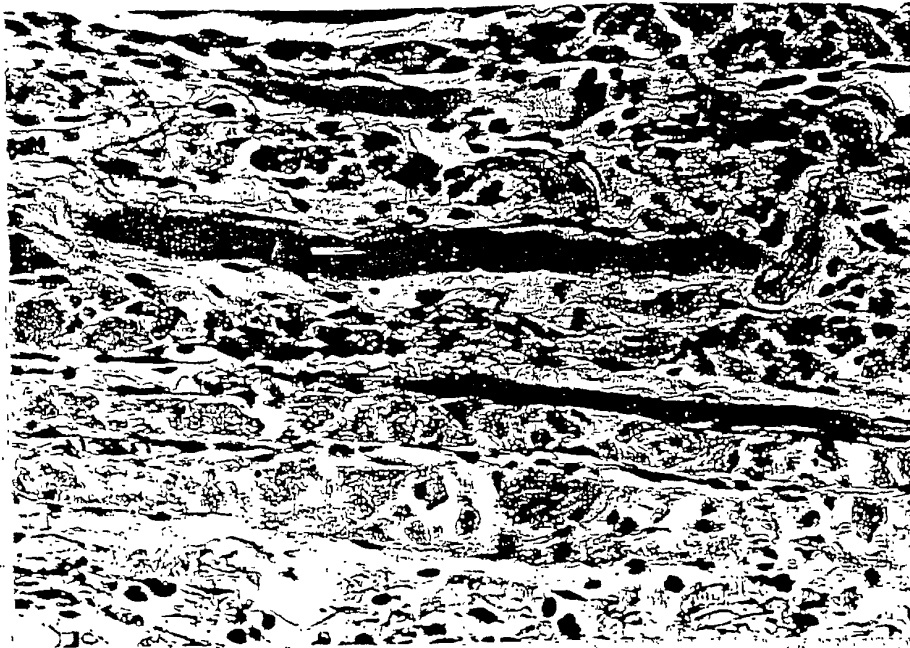


FIGURE 14



FIGURE 15

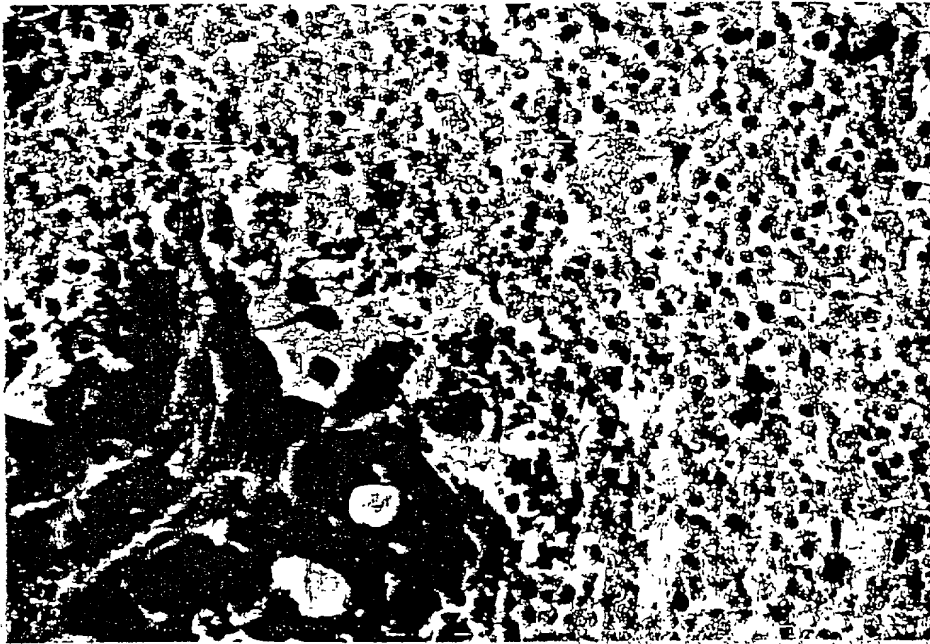


FIGURE 16



FIGURE 17

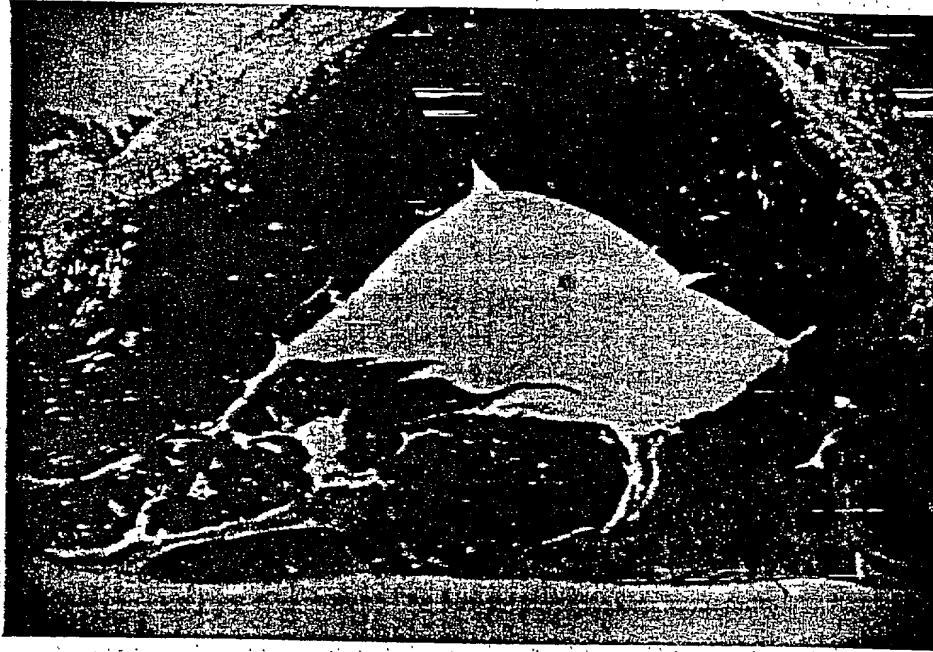


FIGURE 18

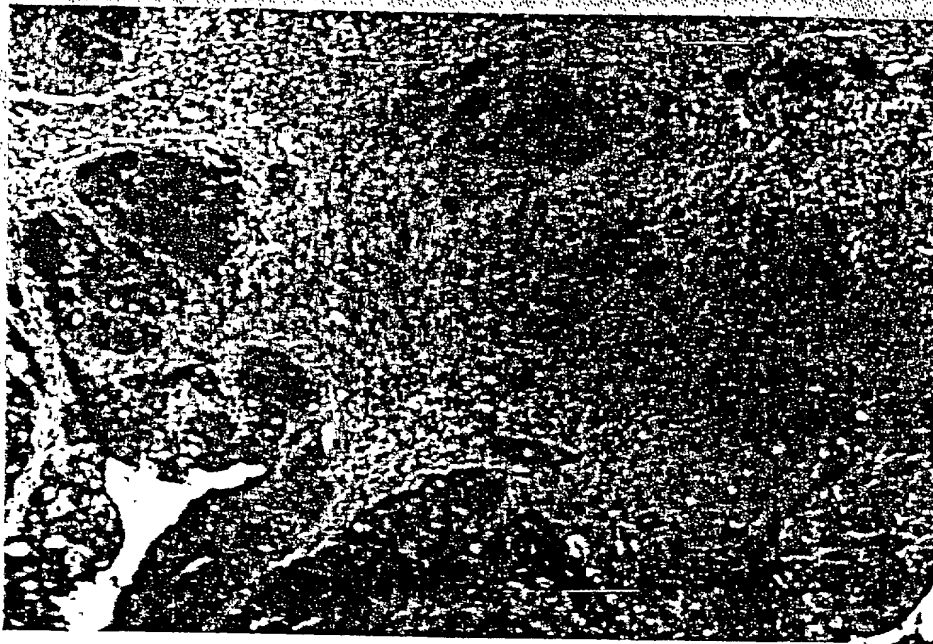


FIGURE 19